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10/580,305	05/15/2007	Yongwei Zhu	7843P006	4054

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EXAMINER

CHAN, KAWING

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2837

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,305	Applicant(s) ZHU, YONGWEI	
	Examiner Kawing Chan	Art Unit 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claim 24 is objected to because of the following informalities: "a pitch detecting a tracking module". Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4-6, 13-16, 21 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finn et al. (US 2003/0023421 A1) in view of Lindemann (US 6,111,183).
4. In Re claims 1, 6, 13, 21 and 24-25, with reference to Figures 1-6, Finn discloses a method and system for searching a database of music files (Abstract), comprising the step of:
 - Converting a melody captured by a microphone (6) to pitch-time series (35) (Paragraphs [0038, 0039]);
 - Approximating the pitch-time series to a sequence of line segments (42) (Paragraph [0053]);

- Mapping the sequence of line segments into a sequence of points (Paragraph [0056]);
- Comparing (29) input melody (20) with a plurality of melodies each stored in a database (9, 10, 28) to determine a stored melody of the plurality of melodies that matches the input melody (30) (Abstract; Paragraphs [0015, 0032, 0033, 0038, 0040, 0060, 0069, 0079, 0080]).

5. But, Finn fails to disclose the sequence of points is in a value-run domain.

6. However, with reference to Figure 2, Lindemann discloses an audio signal synthesis system, wherein a sequence of time-varying pitch values of an audio signal is transformed from time domain to value-run domain (frame number). Since the frame number domain is corresponding to the time domain, the tempo of the signal remains unchanged.

7. Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of Finn with the teachings of Lindemann, since it is known in the art to segment input audio signal into frames so as to be able to determine pitch value for each frame.

8. In Re claims 4 and 16, Finn teaches the melody is input as an analog audio signal (21) (Paragraph [0038]).

9. In Re claims 5 and 14-15, as we have discussed above, Finn in view of Lindemann teaches the converting of a melody to a sequence of points. In addition, with reference to Figure 2, Lindemann discloses an audio signal synthesis system, wherein a sequence of time-varying pitch values of an audio signal is transformed from

time domain to value-run domain (frame number). Also, the sequence of pitch values as shown in Figure 2 is considered as a sequence of points indicating the pitch values of each individual frame number and the skeleton of the input signal. Therefore, the skeleton of the input signal is realized by the extreme points (local maxima and local minima) of the sequence of points.

10. Claims 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finn et al. (US 2003/0023421 A1) in view of Lindemann (US 6,111,183) as applied to claims 1 and 13 above, and further in view of Ozick (US 2003/0233930 A1).

11. In Re claims 2 and 17, Finn teaches pitch values are measured in semitones (Paragraphs [0046, 0050, 0051, 0056], but Finn and Lindemann fail to disclose the pitch values are measured as semitones.

12. However, Ozick discloses a song-matching system and method, wherein the pitch values are measured as relative pitch (Abstract; Paragraphs [0019-0021]).

13. Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of Finn and Lindemann with the teachings of Ozick, since it is known in the art to store the detected notes as relative pitches so as to be able to so as to be able to compare and match stored melodies with the input notes based on the relative pitches.

14. Claims 3, 18-20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finn et al. (US 2003/0023421 A1) in view of Lindemann (US 6,111,183) as applied to claims 1 and 13 above, and further in view of Gibson et al. (US 6,336,092 B1).

15. In Re claims 3 and 18, Finn and Lindemann have been discussed above, but they fail to disclose the step of replacing a non-pitch part by previous pitch value.

16. However, Gibson teaches the step of replacing a non-pitch part by previous pitch value (Column 5, Lines 11-17).

17. Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of Finn and Lindemann with the teachings of Gibson, since it is known in the art to replace the pitch value of a non-pitch part by pitch value of previous or subsequent segment so as to be able to eliminate the pitch value of a non-pitch part of an audio signal.

18. In Re claim 19, Finn teaches the melody is input as an analog audio signal (21) (Paragraph [0038]).

19. In Re claim 20, as we have discussed above, Finn in view of Lindemann teaches the converting of a melody to a sequence of points. In addition, with reference to Figure 2, Lindemann discloses an audio signal synthesis system, wherein a sequence of time-varying pitch values of an audio signal is transformed from time domain to value-run domain (frame number). Also, the sequence of pitch values as shown in Figure 2 is considered as a sequence of points indicating the pitch values of each individual frame number and the skeleton of the input signal. Therefore, the skeleton of the input signal is realized by the extreme points (local maxima and local minima) of the sequence of points.

20. In Re claim 22, Finn teaches the step of comparing (29) input melody (20) with a plurality of melodies each stored in a database (9, 10, 28) to determine a stored melody

of the plurality of melodies that matches the input melody (30) (Abstract; Paragraphs [0015, 0032, 0033, 0038, 0040, 0060, 0069, 0079, 0080]).

21. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Finn et al. (US 2003/0023421 A1) and Lindemann (US 6,111,183) in view of Gibson et al. (US 6,336,092 B1) as applied to claim 22 above, and further in view of Xu et al. (US 2004/0093354 A1).

22. The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

23. In Re claim 23, Finn and Lindemann have been discussed above, but they fail to disclose non-extreme points in the sequence of points are not considered in the matching process.

24. However, with reference to Figures 1-4 and 11-12, Xu discloses a music retrieval method (Abstract), wherein the peak/valley values of query and stored music data are compared (Paragraph [0069]).

25. Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of Finn, Lindemann and Gibson with the teachings of Xu, since it is known in the art to utilize the extreme pitch values in the matching process so as to be able to compute the similarity between the query and stored music files based on the extreme pitch values.

26. Claims 7-8, 10-12 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finn et al. (US 2003/0023421 A1) in view of Ozick (US 2003/0233930 A1) and Lindemann (US 6,111,183).

27. In Re claims 7, 12 and 26-27, with reference to Figures 1-6, Finn discloses a method and system for searching a database of music files by comparing input melody with a plurality of melodies in the database (Abstract), comprising the step of:

- Converting a melody to pitch-time series (35) (Paragraph [0039]);
- Approximating the pitch-time series to a sequence of line segments (42) (Paragraph [0053]);
- Mapping the sequence of line segments into a sequence of points (Paragraph [0056]);

- Comparing (29) input melody (20) with a plurality of melodies each stored in a database (9, 10, 28) to determine a stored melody of the plurality of melodies that matches the input melody (30) (Abstract; Paragraphs [0015, 0032, 0033, 0038, 0040, 0060, 0069, 0079, 0080]).

28. But, Finn fails to disclose the step of storing input melody in the database, the skeleton of the melody is formed by the extreme points of a sequence of points, and the sequence of points is in a value-run domain.

29. However, Ozick discloses a song-matching system and method, wherein the system is capable of storing the detected input notes in a relative pitch scale (Paragraphs [0020, 0021]). Thus, the frequency response of the input notes can be represented by a sequence of points used to indicate the relative pitch between notes.

30. Nevertheless, with reference to Figure 2, Lindemann discloses an audio signal synthesis system, wherein a sequence of time-varying pitch values of an audio signal is transformed from time domain to value-run domain (frame number). Since the frame number domain is corresponding to the time domain, the tempo of the signal remains unchanged.

31. In addition, the sequence of pitch values as shown in Figure 2 is considered as a sequence of points indicating the pitch values of each individual frame number and the skeleton of the input signal. Therefore, the skeleton of the input signal is realized by the extreme points (local maxima and local minima) of the sequence of points.

32. Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of Finn with the

teachings of Lindemann and Ozick, since it is known in the art to segment input audio signal into frames so as to be able to determine pitch value for each frame, and it is also known in the art to store the detected notes as relative pitches so as to be able to so as to be able to compare and match stored melodies with the input notes based on the relative pitches.

33. In Re claim 8, Finn teaches pitch values are measured in semitones (Paragraphs [0046, 0050, 0051, 0056], and also Ozick teaches pitch values are measured as relative pitch (Abstract; Paragraphs [0019-0021]).

34. In Re claim 10, Finn teaches the melody is input as an analog audio signal (21) (Paragraph [0038]).

35. In Re claim 11, as we have discussed above, Finn in view of Lindemann teaches the converting of a melody to a sequence of points. In addition, with reference to Figure 2, Lindemann discloses an audio signal synthesis system, wherein a sequence of time-varying pitch values of an audio signal is transformed from time domain to value-run domain (frame number). Also, the sequence of pitch values as shown in Figure 2 is considered as a sequence of points indicating the pitch values of each individual frame number and the skeleton of the input signal. Therefore, the skeleton of the input signal is realized by the extreme points (local maxima and local minima) of the sequence of points.

36. Claims 9 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finn et al. (US 2003/0023421 A1) in view of Ozick (US 2003/0233930 A1) and

Lindemann (US 6,111,183) as applied to claims 7 and 26-27 above, and further in view of Gibson et al. (US 6,336,092 B1).

37. In Re claim 9, Finn, Ozick and Lindemann have been discussed above, but they fail to disclose the step of replacing a non-pitch part by previous pitch value.

38. However, Gibson teaches the step of replacing a non-pitch part by previous pitch value (Column 5, Lines 11-17).

39. Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of Finn, Ozick and Lindemann with the teachings of Gibson, since it is known in the art to replace the pitch value of a non-pitch part by pitch value of previous or subsequent segment so as to be able to eliminate the pitch value of a non-pitch part of an audio signal.

40. In Re claims 28 and 29, Finn teaches pitch values are measured in semitones (Paragraphs [0046, 0050, 0051, 0056], and also Ozick teaches pitch values are measured as relative pitch (Abstract; Paragraphs [0019-0021])).

41. But, Finn in view of Ozick and Lindemann fail to disclose the step of replacing a non-pitch part by previous pitch value.

42. However, Gibson teaches the step of replacing a non-pitch part by previous pitch value (Column 5, Lines 11-17).

43. Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of Finn, Ozick and Lindemann with the teachings of Gibson, since it is known in the art to replace the pitch

value of a non-pitch part by pitch value of previous or subsequent segment so as to be able to eliminate the pitch value of a non-pitch part of an audio signal.

44. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finn et al. (US 2003/0023421 A1), Ozick (US 2003/0233930 A1) and Lindemann (US 6,111,183) in view of Gibson et al. (US 6,336,092 B1) as applied to claims 26 and 27 above, and further in view of Xu et al. (US 2004/0093354 A1).

45. The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

46. In Re claims 30 and 31, Finn and Lindemann have been discussed above, but they fail to disclose non-extreme points in the sequence of points are not considered in the matching process.

47. However, with reference to Figures 1-4 and 11-12, Xu discloses a music retrieval method (Abstract), wherein the peak/valley values of query and stored music data are compared (Paragraph [0069]).

48. Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of Finn, Ozick, Lindemann and Gibson with the teachings of Xu, since it is known in the art to utilize the utilize the extreme pitch values in the matching process so as to be able to compute the similarity between the query and stored music files based on the extreme pitch values.

Conclusion

49. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Huopaniemi et al., Saito et al., Tolonen et al., Klefenz et al., Bolle et al., Aoki et al., Iwamura, Tsui et al., Teo et al., Kawashima et al. and Ghias et al. are further cited to show related teachings in the art.

50. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kawing Chan whose telephone number is (571)270-3909. The examiner can normally be reached on Mon-Fri 9am-5pm.

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51. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Benson can be reached on 571-272-2227. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

52. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kawing Chan
Examiner
Art Unit 2837

/Jeffrey Donels/
Primary Examiner, Art Unit 2837